H.264 DVR
MICRO-D

Installation & User's Manual

※ *The contents of the manual can be modified without prior notice to customers*

GENERAL SAFETY AND PRECAUTIONS

The MICRO-D is manufactured to meet international safety standards. Read the following safety precautions to avoid injury and prevent damage to the MICRO-D or any products connected to it.

1. Use a correct power source. Do not connect this product to a power source that supplies more than the specified voltage (DC12V), as this will cause damage to the unit.

2. Never insert anything metallic into the MICRO-D as this can cause electric shock.

3. Do not operate in wet & dusty conditions. Keep product surfaces clean and dry. Avoid placing the MICRO-D in areas like a damp basement or a dusty hallway.

4. Do not expose this product to rain or use near water. If the product gets wet, unplug it and contact an authorized dealer immediately.

5. To clean the outside case of the MICRO-D, use a lightly dampened cloth (no solvents).

6. Do not operate if you suspected to unit is faulty. If there are any unusual sounds or smells coming from the MICRO-D, immediately unplug it and contact an authorized dealer or service centre.
7. Do not attempt to remove the top cover.

8. Warning: Removing the MICRO-D's cover can cause an electrical shock.

9. Handle MICRO-D carefully to avoid damaging the product. Dropping your MICRO-D on any hard surface may cause the unit to malfunction. If the MICRO-D does not work properly due to physical damage, contact an authorized dealer for repair or exchange.

10. The unit has a lithium battery preinstalled.
    The standard lithium cell 3V battery located on the motherboard should be replaced if the time clock does not hold its time after the power is turned off.

Warning:
Unplug the MICRO-D before replacing battery or you may be subjected to severe electrical shock. Properly dispose of old batteries.

Caution:
Risk of explosion if battery is replaced by an incorrect type. Do not discard lithium batteries into the trash can or into fire. Dispose in accordance with local waste regulations.

Information to user
The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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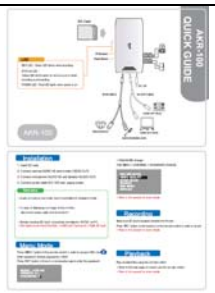
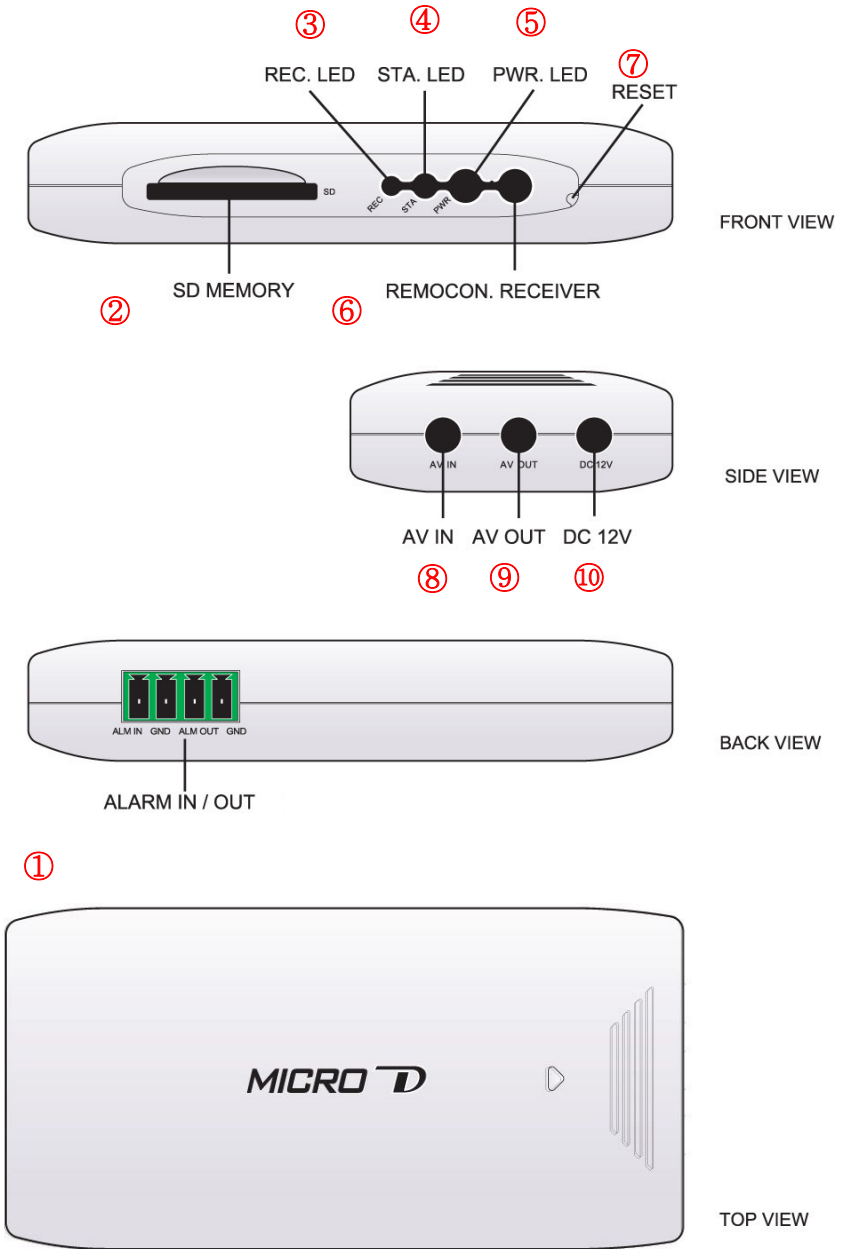
Chapter 1: Packing Contents

▶ Contents in the package

MICRO-D Main Unit	Remote Controller	AV-IN / AV-OUT Connector
Terminal Block	12V Power Supply	Installation CD
		
Quick Guide	Max. 32GB SD card Can be used(Option)	SD Reader (Option)

Chapter 2: Getting To Know Your MICRO-D

▶ MICRO-D



This chapter briefly describes the functions of each button on MICRO-D. The buttons are used to operate the basic functions of MICRO-D, such as recording, playback, fast-forward, reverse play and etc. For more details on the set-up and operation of MICRO-D, refer to Chapter 6, MICRO-D MENU.

1	**Sensor-in / Alarm-out**
	The sensor-in is installed to connect Sensor Terminal Block on the main body of MICRO-D and alarm activates when event occurs. If you add motion sensor devices to your MICRO-D, the video recording can be triggered by event. The alarm output terminal is used to install a single alarm device.
2	**SD Memory Slot**
	Insert or remove the SD CARD.
3	**Recording LED**
	GREEN LED turns on during Recording mode.
4	**Status LED**
	STA LED turns on when Event occurs or Error. (Recording Mode: GREEN LED ON & ORANGE LED BLINK, Error: ORANGE LED BLINK)
5	**Power LED**
	RED LED turns on when power is up.
6	**Remote control Receiver**
	When controlling MICRO-D by remote control, be sure to point at the receiver.
7	**Reset**
	Product returns to default value.
8	**AV-IN**
	AUDIO/VIDEO INPUT PORT
9	**AV-OUT**
	AUDIO/VIDEO OUTPUT PORT
10	**Power**
	12V POWER INPUT PORT

Chapter 3: Remote control

1		**REC**	Start EMERGENCY RECORDING or stops recording.
2		**MENU**	Enter & Exit from OSD menu mode.
3		**UP/ DOWN**	Change values from OSD menu. On SEARCH MODE, find recorded files.
4		**LEFT/ RIGHT**	Change values from OSD menu. REW: Fast Rewind(X2-X4-X8-X16) FF: Fast Forward(X2-X4-X8-X16)
5		**REW**	Fast Rewind(X2-X4-X8-X16)
6		**FF**	Fast Forward(X2-X4-X8-X16)
7		**PLAY**	Playback
8		**STOP**	Stop playback.(Display the first frame of the playback file) ※SD CARD POWER OFF(Press for 1 SEC)
9		**PAUSE**	Pause playback or resume playback.
10		**MUTE**	Remove Audio during playback.
11		**ENT**	On PLAYBACK MODE, playback at X1. From OSD MENU, new setting value completed

12		**SEARCH**	Enter & Exit SEARCH menu.
13		**MODE**	Switch between playback mode and live view mode.

Remote Control Key Function on Each Mode(LIVE VIEW / PLAYBACK / MENU)

Function	LIVE		PLAY BACK			
	Stand-by	Recording	Stand-by	Play	Menu	Remark
RECORD	O	O	X	X	X	O: Available X: N/A
MENU	O	X	O	O	O	
SEARCH	O	X	O	O	X	
MODE	O	X	O	O	O	
UP	X	X	O	O	O	
DOWN	X	X	O	O	O	
REW(LEFT)	X	X	X	O	O	
FF(RIGHT)	X	X	X	O	O	
ENT	X	X	O	O	O	
REW	X	X	X	O	O	
FF	X	X	X	O	O	
PLAY	X	X	O	O	O	
STOP	X(O)	X(O)	X(O)	O	X(O)	
PAUSE	X	X	X	O	X	
MUTE	X	X	X	O	X	

Chapter 4: Getting Started

OVERVIEW ON SET-UP PROCEDURES

Below is an overview of the MICRO-D installation procedures, (A detailed explanation is found in Chapter 5 - Hardware Installation.)

(1) Insert a SD MEMORY.
(2) Connect MICRO-D to a TV set or MONITOR.
(3) Connect camera to MICRO-D
(4) Connect optional accessories (sensors or alarm).
(6) Connect the power.
(7) Turn the power on.
(8) Start TV Monitoring and recording.

General Operating Advice:

● Make sure that a SD Memory is inserted and one camera is properly connected.
(See Chapter 5 -Hardware Installation)

● The SD Memory Format setting must be set (Refer to Chapter 5 – SD Memory Installation for more information.) Otherwise, MICRO-D may not recognize the SD Memory.

● The firmware used in MICRO-D is compatible with your computer's operating system (i.e. Windows). Therefore, you can take the SD memory card from this MICRO-D and install it in your computer to view recorded video. (Refer to the PC Viewer manual.)

● MICRO-D offers you the flexibility to choose a recording frame rate (maximum rate: 30 frames per second). A faster frame rate provides more natural video images in recorded video files. However, it requires more SD Memory storage. You may reduce the frame rate (minimum rate: 1 frame per second) to fit longer recording sessions in consideration of your SD card capacity.

● If a camera is normally connected to MICRO-D, it enters the default operational state: VIEW mode. In this mode, MICRO-D does not record nor play the recorded stream. It just shows the current images from camera connected to MICRO-D.

● The default values of MICRO-D for recording are set up at 30 frames per second with High video quality.
If you use 1GB SD Memory, MICRO-D can record approximately for 2 hours in a row.

● There is an exception to entering the VIEW mode at start up. If the power is abnormally turned off while MICRO-D is performing emergency recording (i.e. a power failure), it will enter recording mode automatically when you reboot MICRO-D.

Refer to Chapter 5 - Hardware Installation for more information on installation procedures.

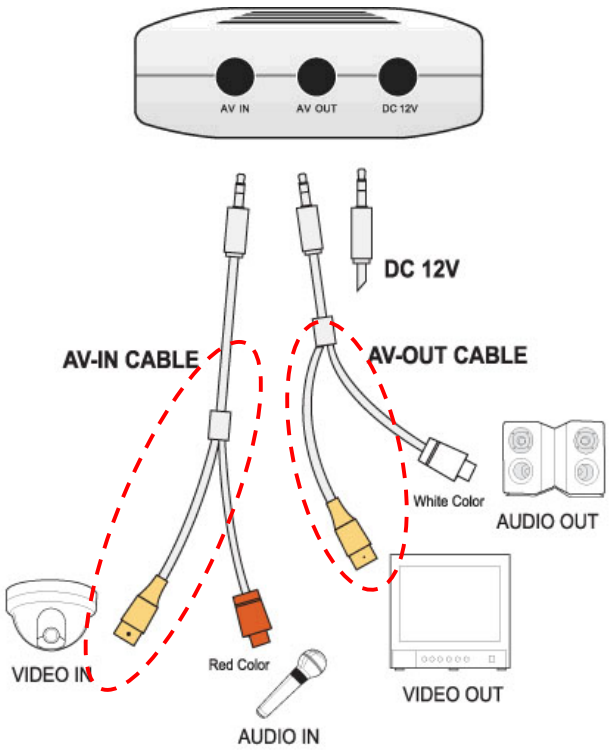
Chapter 5: Hardware Installation

SD MEMORY INSTALLATION

① Format SD Memory	Insert SD memory into SD card slot on your PC and format it in FAT32. **※ Be sure to format SD Card in FAT32 and set default allocation size to below 32KB**
② Insert SD Memory into SD slot on MICRO-D	After formatting, take SD Memory from your PC and insert it into SD slot on MICRO-D.
③ Backup recorded files in SD Memory	When SD Memory storage is full, the recorded files can be backed up in your PC. Insert SD card in your PC and move the files of SD card into the HDD of our PC. You can also check each recorded file through Micro D Player.

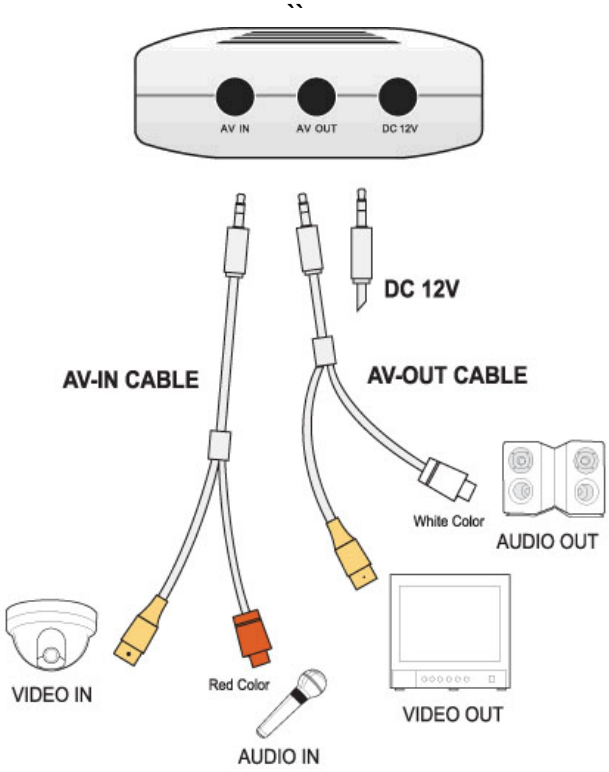
CONNECTING MICRO-D TO YOUR TV SET OR MONITOR

① Video Input/Output Connection (For TV / monitor screen display)



To display images from the MICRO-D, connect the video output signal to your MONITOR or TELEVISION. Any Television with a VIDEO INPUT terminal is suitable for displaying the images. The diagram above shows the video signal connections.
Connect the CAMERA to VIDEO-IN terminal of AV-IN connector; connect the MONITOR to VIDEO OUT terminal of AV-OUT connector.
Note: The RCA cable required for this connection is not supplied with the MICRO-D.

② Audio Input/Output Connection (For TV / monitor speaker)



Connect the microphone to AUDIO-IN terminal of AV-IN connector; connect the speaker to AUDIO OUT terminal of AV-OUT connector.

Note: The RCA cable required for this connection is not supplied with the MICRO-D.

※SanDisk SD cards have been tested and proved to be compatible with MICRO-D. But SD specifications can be changed without prior notice. So be sure to check with local distributors regarding compatibility of the SD CARD before purchasing.

The compatibility with other brands is not guaranteed.

Recommended SD Cards:

- SDHC: SanDisk 4GB/ 8GB/ 16GB/ 32GB

※MICRO-D has limitation to generate files to 2000. In case of using high capacity SD card and recording files have short playback time, the total capacity of the SD CARD may not be fully used.

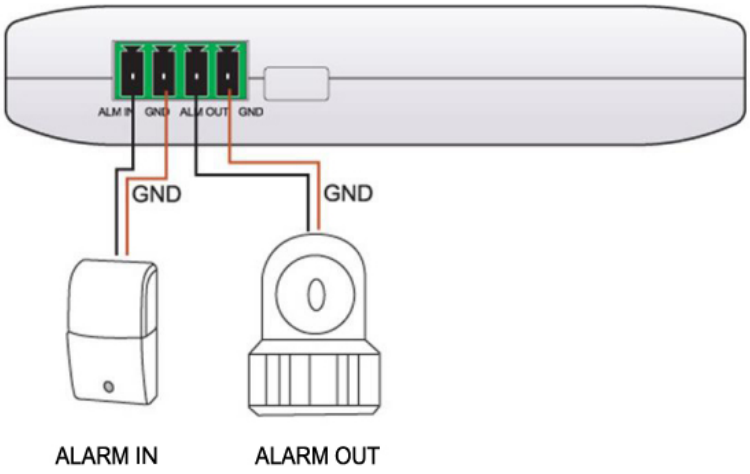
⚠ **CUATION**
If you want to remove SD CARD during recording, press STOP button first for more than 1 second to power off SD card. SD CARD POWER Off status lasts for about 20 seconds. (REC LED flickers)

ALARM INSTALLATION

The MICRO-D has an internal switch for sounding an alarm. When a sensor is triggered, the alarm is activated as well.

There are two steps to install an alarm.
1. Connect the alarm power lines to the alarm switch terminal.
2. Connect the alarm power lines to the appropriate power source.

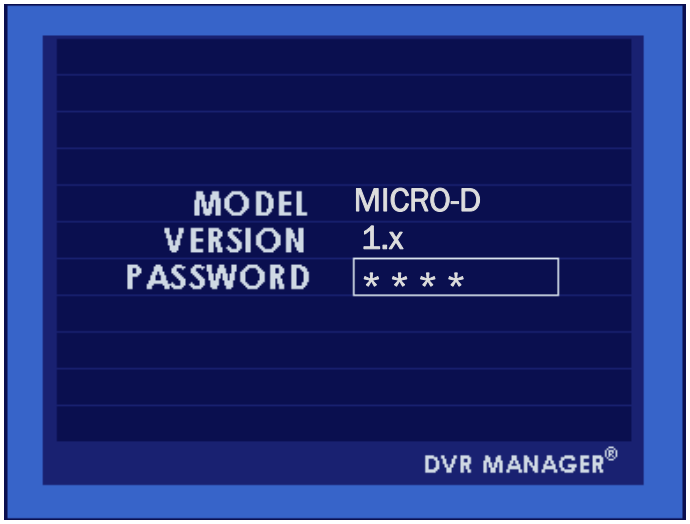
Refer to the diagram below for information on how to connect an alarm to your MICRO-D.



Note: Contact an authorized dealer for information about buying the appropriate alarm device for your needs and for information concerning proper installation procedures.

Chapter 6: OSD MODE

1. ACCESS TO OSD MENU



Press ‘MENU’ button on remote control to access to MICRO-D OSD menu.
Please refer to ‘Chapter 3: Remote control’ about how to use remote control buttons.

Password is ‘0000’ as default. The password can be changed on ‘[SUB MENU]→[PASSWORD CHANGE]’.
In order to select cameras for recording, set recoding quality, schedule recording times and to set other operation parameters, you will need to access the MICRO-D menu.

2. MAIN MENU

In the main menu, the ‘indicator ‘**>**’ will be shown on the left of each menu.
Press ‘UP/DOWN’ button on remote control to select a desired menu. When ‘**>**’ is indicated on the desired menu press ‘ENTER’ button to enter the menu.

3. SYSTEM SETUP

3.1 TIME & DATE OVERLAY: The option to display 'TIME and DATE' stamp on the screen. Select 'OFF' when you don't want "Time and Date' stamp on the screen on LIVE VIEW Mode or Playback Mode.

3.2 TIME SET: SETUP TIME

3.2.1 DAY LIGHT SAVING: SELECT 'ON', when you want to apply day light saving. Set up specific period when day light saving is applied.

3.3 TIME CORRECTION: When there is discrepancy between Micro-D time and actual time, user can correct the discrepant time.

3.3.1 Time: -999 sec (Micro-D time is ahead of actual time) ~ +999 sec (Micro-D time is behind the actual time)

3.3.2 Correction Cycle: Select correction cycle among Day / Week / Month.

3.3.3 How to Setup Time Correction

① Find the time error: Check how much difference occurs between Micro-D time and actual time.
② Re-setup the time of Micro-D to current time.
③ Enter correction time and cycle.
- When Micro-D time is ahead of actual time: Insert minus value by pressing button.
- When Micro-D time is behind the actual time: Insert plus value by pressing button.

[Example]

Start time to get time error	: 2010/07/05 12:00:00
Finish time to get time error	: 2010/07/12 12:00:00
TIME Error	: 2010/07/12 12:01:00
Error for 7 days	: +60sec

Time Setting: 2010/07/12 12:00:00
Time Correction: -060sec / Week
When time correction is applied:
2010/07/19 12:00:00

※ Time correction is not applied on recording mode even when correction time comes.
On 'Full Recording (Emergency Recording)' mode, recording block generates by 30 minutes. Time correction is applied when 30 minute recording block closes on 'Full Recording' mode.

3.4 LANGUAGE SETUP

English, French, Dutch, German, Spanish. Japanese, Chinese

3.5 VIDEO OUTPUT

Display NTSC or PAL according to unit's CCD type.

3.6 BRIGHTNESS

Select brightness value among low, normal and high.

4. VIDEO SETUP

4.1 RESOLUTION

Select video resolution(4CIF / 2CIF / CIF)

LIVE VIEW Resolution - PAL

	HIGH	NORMAL	LOW
4CIF	704x576 / 25fps	704x576 / 25fps	704x576 / 25fps
2CIF	704x288 / 25fps	704x288 / 25fps	704x288 / 25fps
CIF	352x288 / 25fps	352x288 / 25fps	352x288 / 25fps

LIVE VIEW Resolution - NTSC

	HIGH	NORMAL	LOW
4CIF	704x480 / 30fps	704x480 / 30fps	704x480 / 30fps
2CIF	704x240 / 30fps	704x240 / 30fps	704x240 / 30fps
CIF	352x240 / 30fps	352x240 / 30fps	352x240 / 30fps

PLAYBACK Resolution - PAL

	HIGH	NORMAL	LOW
4CIF	704x576	704x576	704x576
2CIF	704x576	704x576	704x576
CIF	704x576	704x576	704x576

PLAYBACK Resolution - NTSC

	HIGH	NORMAL	LOW
4CIF	704x480	704x480	704x480
2CIF	704x480	704x480	704x480
CIF	704x480	704x480	704x480

4.2 VIDEO QUALITY

(HIGH / NORMAL / LOW): Select desired video level

MODE	HIGH	NORMAL	LOW
QUALITY(4CIF)	1800kbps	1000kbps	500kbps
QUALITY(2CIF)	1200kbps	800kbps	400kbps
QUALITY(CIF)	1000kbps	600kbps	300kbps

4.3 FRAME RATE

PAL: Selectable among 25, 12, 8, 6, 3, 1
NTSC: Selectable among 30, 15, 10, 6, 3, 1

4.4 PRE RECORDING TIME

MODE	HIGH		NORMAL		LOW	
	Bit Rate (kbps)	Pre Recording Time	Bit Rate (kbps)	Pre Recording Time	Bit Rate (kbps)	Pre Recording Time
4CIF	1800	10sec	1000	20 sec	500	30 sec
2CIF	1200	15 sec	800	25 sec	400	35 sec
CIF	1000	20 sec	600	30 sec	300	40 sec

4.5 POST RECORDING TIME

Post recording time means the recording time between the beginning and end of an event.
(Min. 5 sec, Max. 30 min)

4.6 AUDIO INPUT LEVEL

User can select from '0' to '10' according to microphone input level.
- '0: Audio Recording Off
- 1: lowering microphone level
- 10: Increasing microphone level

4.7 AUTO RECORDING: Starts recording automatically 30 seconds after power is up.

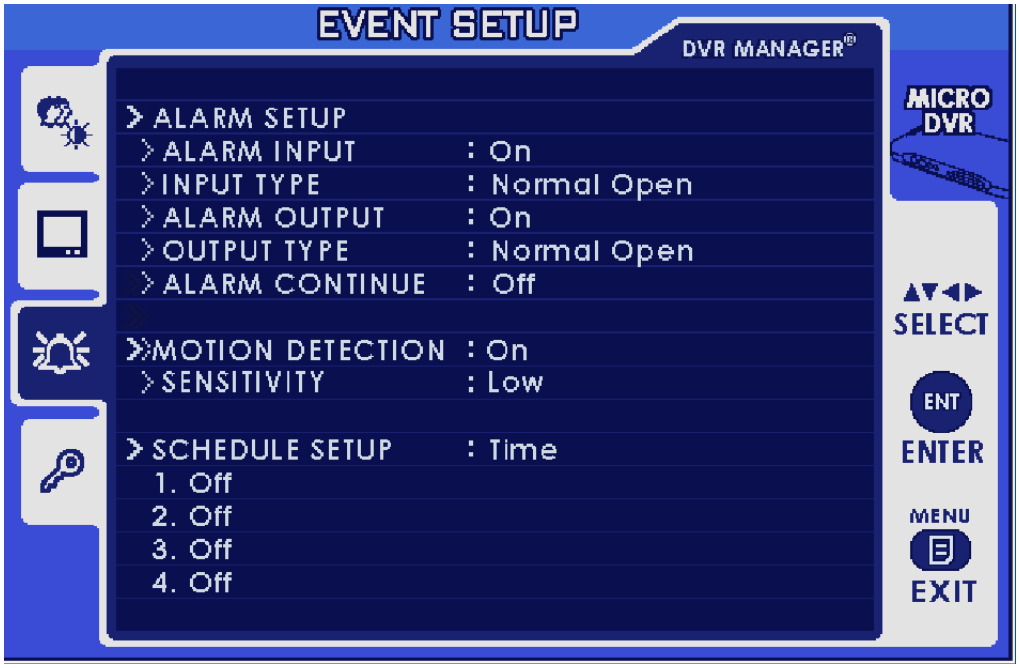
4.8 DISK OVERWRITE

If overwrite is set to ON, the MICRO-D will continue recording while automatically overwriting the oldest recorded files when SD memory storage capacity is full. Set to OFF, the recording will stop when the SD Memory is full.

4.8.1. SD CARD FULL WARNING: Select 'ON' if you want to display 'SD CARD FULL WARNING' when the SD card is full. Icon appears on screen.

4.8.2. REMAINING TIME: Remaining time for possible recording time.

5. EVENT SETUP



5.1 ALARM SETUP: Setup ALARM CONDITION

5.1.1 ALARM INPUT: Setup ALARM INPUT ON/OFF
Select 'ON' for ALARM EVENT RECORDING.

5.1.2 INPUT TYPE: Select alarm input type between ‘Normal Open’ and ‘Normal Close’
NC: NORMAL CLOSE
NO: NORMAL OPEN

5.1.3 ALARM OUTPUT:

ALARM INPUT	ALARM OUTPUT	
Normal Open	**Normal Open**	Alarm input type is Normal Open. The device connected to alarm output is in ‘OFF ‘status and turns ON when events occur.
Normal Open	**Normal Close**	Alarm input type is Normal Open. The device connected to alarm output is in ‘ON ‘status and turns OFF when events occur.
Normal Close	**Normal Open**	Alarm input type is Normal Close. The device connected to alarm output is in ‘OFF ‘status and turns ON when events occur.
Normal Close	**Normal Close**	Alarm input type is Normal Close. The device connected to alarm output is in ‘ON ‘status and turns OFF when events occur.

5.1.4 ALARM CONTINUE
Continues recording until event stops regardless of post recording

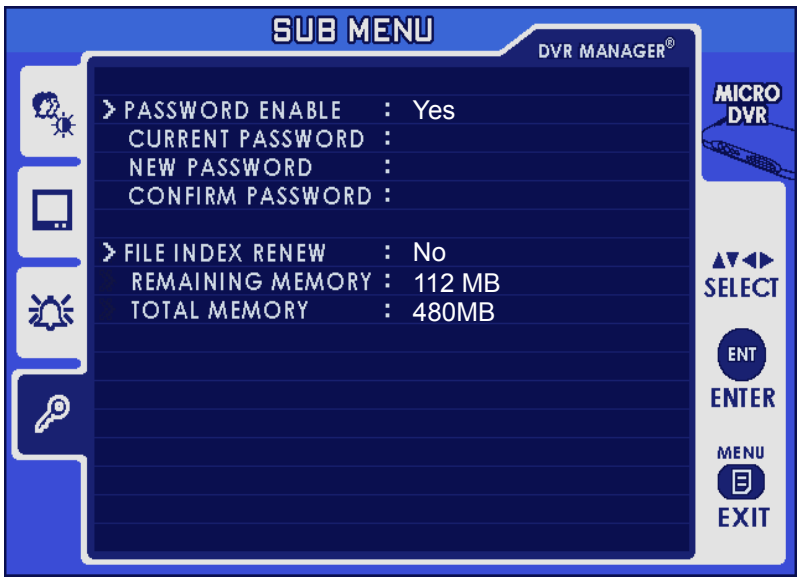
5.2 MOTION DETECTION
5.3.1 Select the degree of sensitivity of motion detection in terms of (LOW / NORMAL / HIGH).

5.3 SCHEDULE SETUP
Make schedule for the recording time. Up to 4 schedules can be set.

5.3.1 TIME: Start to record when scheduled recording time is up.
5.3.2 TIME & EVENT: to record when motion is detected or an alarm occurs within scheduled period.

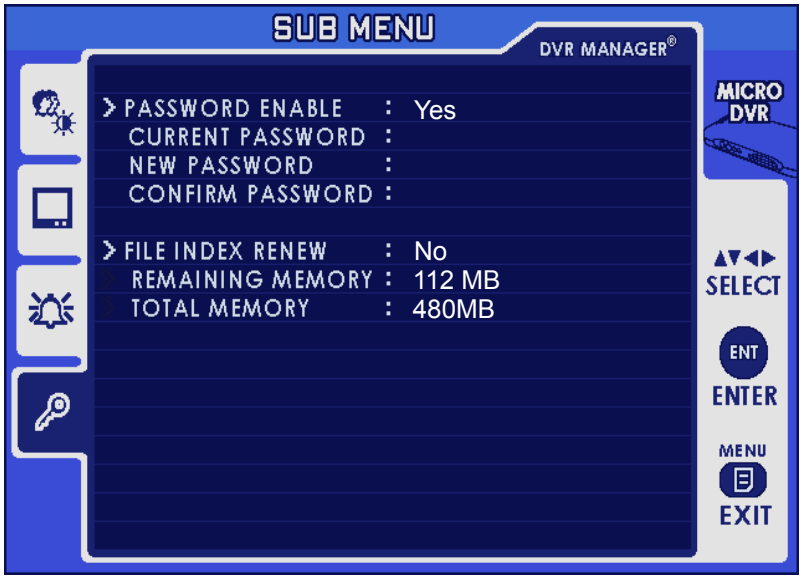
6. SUB MENU

6.1 PASSWORD CHANGE



The Factory Default Password is 0000. To enter this number, press the UP, DOWN button on the remote control. Once you input the current password, set a new four digit password using the buttons UP, DOWN on the remote control. Then, confirm your new password by entering the number again. *****
PASSWORD ENABLE: 'NO'
Select 'NO', if you want to enter the OSD MENU without Password.

6.2 FILE INDEX RENEW



The index file is automatically generated and stored in the SD card when inserted into MICRO-D. If the index file does not match the files actually stored in the SD card, users can synchronize the index file list and the actual file list. While synchronizing, the process percentage is displayed; on completion the value returns to 'NO'.

Chapter 7: SCREEN MODE

7.1 LIVE SCREEN MODE

In LIVE SCREEN MODE, 'TIME & DATE' information, screen icons and messages are displayed on the screen.

7.1.1 SCREEN MESSAGE

Message	Description
INITIALIZING…	Displays when the MICRO-D is initializing during booting.
WAIT…	Displays when PLAYBACK &LIVE MODE are switched or searching recorded files.
FILE NOT FOUND	Displays when there is no recorded files in the SD or no search result on search mode.
SD CARD ERROR	Displays when the SD card is physically damaged or recorded files in the SD CARD are damaged.
NO SIGNAL	Displays when there is no video input.
SD CARD LOCKED	Displays when SD CARD is locked or has an error.
INSERT SD CARD!	Displays when there is no SD CARD.
SD CARD FULL!	Displays when SD CARD is full so that video files can not be recorded. (OVERWRITE OFF)
MEMORY ERROR	Displays when there is error in SDR2 FILE

7.1.2 SCREEN ICON

	EMERGENCY	Displays during EMERGENCY RECORD MODE.
	MOTION	Displays during MOTION - TRIGERED MODE.
	ALARM	Displays during SENSOR-TRIGERED RECORD MODE
	TIME	Displays during SCHEDULE RECORD MODE.
	FULL	Displays when empty space remains less than 5% of the total SD Card storage. The icon disappears when 'disk full warning is set to 'OFF' on OSD menu.
	SYNC	Displays when the content of index file is not matched with recorded files actually stored in the SD. The icon disappears when 'memory synch' is performed on OSD menu.
	SEARCH	Displays during SEARCH MODE.

N.B. All Recording Indicators will show up first with red color very shortly and then turn into white.

RED INDICATOR: Recording is processing. But if you stop recording, no file is made and thus it is not saved.(The unit has not had the time to form a file)

WHITE INDICATOR: When the white indicator is displayed, it means the recorded file can be made, even if you stop recording.

7.2 SEARCH MODE

When pressing ‘SEARCH’ button, LOGIN window appears.
To Enter ‘Search Mode’, enter 4-digit password.

7.2.1 SEARCH LIST

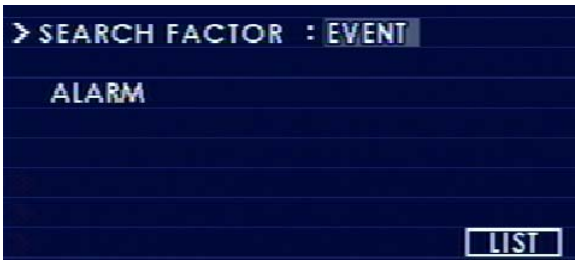
After pressing **‘SEARCH’** button on remote control, click ‘LIST’. The search results will be listed.

7.2.2 SEARCH FACTOR:

There are four ways to search recorded files; **TIME, EVENT, BOTH (TIME & EVENT), NONE**

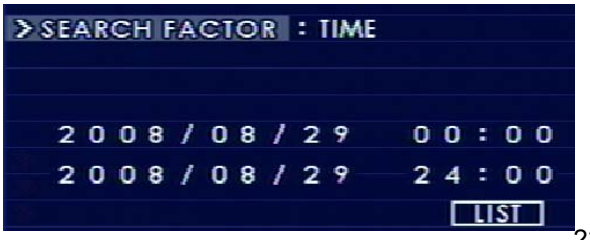
7.2.2-1 SEARCH FACTOR – EVENT:

When you select ‘EVENT (or BOTH) on SEARCH MODE’, subordinate search conditions open; ALARM / MOTION / EMERGENCY / TIME (Here, the time means “scheduled time recording” using scheduling feature) More than two conditions can be selected. In this case, each condition is connected with ‘OR’ condition.



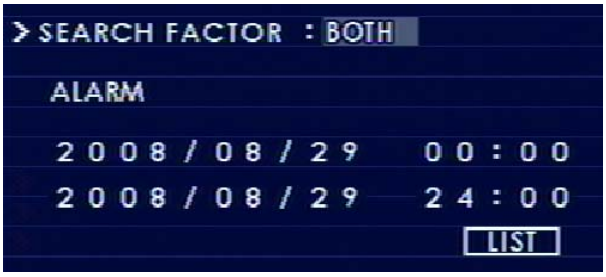
* **ALARM:** To search recorded files triggered by alarm-in event.
* **MOTION**: To search recorded files triggered by motion
* **EMERGENCY**: To search recorded files generated by emergency recording (full recording)
* **TIME**(scheduled time): To search recorded files generated by time schedule

7.2.2-2 SEARCH FACTOR – TIME:



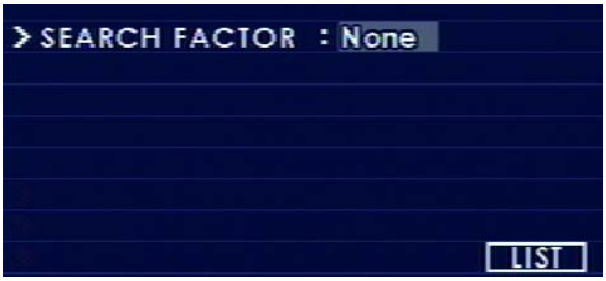
To search recorded all files within the specific period of time.
Enter the time period you wish to search for.

7.2.2-3 SEARCH FACTOR – BOTH:‘



When you select BOTH, search factors are combined in multiple conditions such as TIME and ALARM / TIME and MOTION /TIME and MOTION and EMERGENCY etc.

7.2.2-4 SEARCH FACTOR – NONE:



To search all the recorded files stored in the SD card.

7.2.3 PLAYBACK SCREEN VIEW

< Play Back Screen View >

APPENDIX

TECHNICAL SPECIFICATION

ITEM	DESCRIPTION			
VIDEO				
Encoding	H.264			
Input Channel	1 Ch.			
Input impedance	75 ohm Unbalanced			
Input Format	PAL/NTSC(Auto Detection), Composite, Auto detection function			
Maximum Input	1.0Vp-p @ 75 Ohm Unbalanced			
Output Channel	1 Ch.			
Output impedance	75 ohm Unbalanced			
Output Format	PAL/NTSC(according to Input), Composite			
Maximum Output	1.0Vp-p @ 75 Ohm Unbalanced			
RECORDING				
Video Recording Resolution				
	Format	PAL	NTSC	
	4CIF	704x576	704x480	
	2CIF	704x288	704x240	
	CIF	352x288	352x240	
Video Recording Quality				
	Format	High	Normal	Low
	4CIF	1800Kbps	1000Kbps	500Kbps
	2CIF	1200Kbps	800Kbps	400Kbps
	CIF	1000Kbps	600Kbps	300Kbps
Video Recording Frame Rate				
	PAL	25, 12, 8, 6, 3, 1 fps		
	NTSC	30, 15, 10, 6, 3, 1 fps		
Recording MODE	Emergency / Schedule / Alarm / Motion Detection			
Decoding Video Format	As recorded Quality & Frame Rate			
Pre-recording Time	> 10sec(by Video Quality Setup)			
Storage	Support SD, SDHC(4GB/ 8GB/ 16GB/ 32GB max.)			
Storage File System	FAT32 : Default allocation size to below 32KB			
Maximum Recording File	2,000 files /Storage Device			
AUDIO				
Compression Format	16bit PCM, 8KHz			
Input Channel	1 Ch. Mono			
Input impedance	> 4.7Kohm, Unbalanced			
Maximum Input	6 mVp-p @600ohm			
Output Channel	1 Ch. Mono			
Maximum Output	13mW@RL =16ohm, Unbalanced			

Alarm	
Input	1 Ch. TTL(Internal full-up)
Output	1 Ch. TTL(Open collector)
OPERATING MODE	
Searching Method	Time/Event
Operating MODE	Live/Playback/Menu
VIEWER SOFTWARE	
Monitoring Environment	Client S/W
Connection	Supporting 1 Client
I/O	
A/Video Input	1Port, Female Stereo Phone Jack(include Jack Conversion Cable)
A/Video Output	1Port, Female Stereo Phone Jack(include Jack Conversion Cable)
Alarm I/O	1Port, Pluggable Terminal Block(include Plug)
SD Slot	1Port, SD Card Slot
DC Power Input	1Port, DC Power Jack
OTHERS	
LED	3 Status LED
Storage	Support SD, SDHC(4GB/8GB/16GB/32GB max.)
POWER	
Power consumption	Approx. 150mA@ 12V
ENVIRONMENTAL	
Operating Temperature.	-20 ~ +60 °C
Humidity	30 ~ 80 %RH(non-condensing)
PHYSICAL	
Dimension	92(W) x 46(L) x 18(H) mm
Weight	Approx. 50g
ACCESSORY	
Remote Control	Supplied

Approximate Recording Time Table

4CIF(704x480 / D1) Recoding Time(NTSC/PAL): SANDISK – SD/SDHC MEMORY

Memory	Usable Memory	HIGH / 4CIF / 25fps	NORMAL / 4CIF /25fps	LOW / 4CIF / 25fps
1 GB	960 MB	58min	1hr 40min	3hr
2 GB	1.9 GB	2hr 2min	3hr 26min	6hr 10min
4 GB	3.8 GB	4hr 4min	6hr 57min	12hr 29min
8 GB	7.4 GB	8hr 3min	13hr 46min	24hr 44min
16 GB	14.9 GB	16hr	27hr 42min	49hr 46min
32 GB	30.2GB	32hr 52min	56hr 11min	100hr

2CIF(704x240) Recoding Time(NTSC/PAL): SANDISK – SD/SDHC MEMORY

Memory	Usable Memory	HIGH / 2CIF / 25fps	NORMAL / 2CIF / 25fps	LOW / 2CIF / 25fps
1 GB	960 MB	1hr 25min	2hr 1min	3hr 34min
2 GB	1.9 GB	2hr 55min	4hr 10min	7hr 20min
4 GB	3.8 GB	5hr 54min	8hr 27min	14hr 51min
8GB	7.4 GB	11hr 42min	16hr 44min	29hr 25min
16 GB	14.9 GB	23hr 32min	33hr 41min	59hr 12min
32 GB	30.2 GB	47hr 43min	68hr 18min	120hr

CIF(352x240) Recoding Time(NTSC/PAL): SANDISK – SD/SDHC MEMORY

Memory	Usable Memory	HIGH /CIF / 25fps	NORMAL /CIF / 25fps	LOW / CIF/ 25fps
1 GB	960 MB	1hr 40min	2hr 35min	4hr 24min
2 GB	1.9 GB	3hr 26min	5hr 19min	9hr 3min
4 GB	3.8 GB	6hr 57min	10hr 46min	18hr 20min
8 GB	7.4 GB	13hr 46min	21hr 20min	36hr 18min
16 GB	14.9 GB	27hr 42min	42hr 56min	73hr 2min
32 GB	30.2 GB	56hr 11min	87hr 4min	148hr

※ Micro-D has limitation to generate files to 2000. In case of using high capacity SD card and recording files have short playback time, the total capacity of the SD CARD may not be fully used.

※Recording time can differ according to SD card kinds.